REMARKS/ARGUMENTS

This letter is responsive to the Office Action date January 20, 2006. This response is accompanied by a request for a two-month extension of time. Please charge our deposit account number 022095 in the amount of $450.00 for the extension of time. Please also charge any additional fees that may be required, or credit any overpayment, to our deposit account.

In the Office action, the Examiner rejected claims 1-3, 5-11, 12-16, 31-33, 35-40, and 42-44 under 35 U.S.C. 102(b) as being anticipated by Baker (4,595,430). The Examiner noted on page 2 of the detailed action that Baker discloses an explosive composition containing ammonium nitrate of 68%, carbonaceous fuel of 5.25%, and an epoxidized soybean oil of 3%. The Examiner referred the applicant to the chart in Column 8 and Examples 2-24. The Examiner also noted in the last paragraph of the detailed action that the issues of "density and oil separation are inherent properties of this composition".

The applicant has carefully considered the rejection raised by the Examiner and respectfully traverses it. First, the applicant notes that Baker is directed to dynamite whereas the applicant's invention is directed to an ANFO explosive composition. Secondly, the epoxidized soybean oil is used as a desensitizer in Baker whereas the applicant discloses its use as a stabilizer.

With respect to the first point, the applicant notes that the title of Baker is "Desensitized Dynamites". In the discussion of the background art, Baker states at column 1, lines 12 - 32 as follows.

> Dynamite is a mixture of nitroglycerin and/or ethylene glycol dinitrate (hereinafter referred to as "EGDN") along with various nitrate salts and carbonaceous absorbants.... Dynamite is a hazardous material, both to manufacture and use.

The hazards involved in utilizing dynamite result from its sensitivity. In the explosives art, sensitivity is the relative ease with which a particular explosive may be detonated by a particular impulse, for example, impact, explosion, fire or friction. To lessen the hazard of accidental initiation, the widespread use of ANFO became common in the industry. ANFO is ammonium nitrate fuel oil mixture and is relatively insensitive to detonation except by the use of a booster charge. ANFO had the disadvantage of being deactivated by water.

Accordingly, as recognized by Baker, ANFO explosive compositions are a different type of explosive then dynamites. As taught by Baker, dynamites tend to be too sensitive to detonation whereas ANFO are insensitive to detonation. Dynamites utilizes nitroglycerin and/or ethylene glycol dinitrate as well as nitrate salts. Further, in Examples 2-24, the formulation utilized 65% ammonium nitrate. (Note that in Examples 2-24, the control contained 68% ammonium nitrate. In the tests, 3% of the ammonium nitrate was removed and was replaced by 3% of a compound in Table II.) In contrast, ANFO explosive compositions typically contain ammonium nitrate and fuel oil, wherein some of the ammonium nitrate may be replaced with alternate salts. The formulation generally comprises about 94 weight percent inorganic oxidizer including ammonium nitrate and about 6 weight percent fuel oil, with the addition of sensitizers and minor quantities of other standard additives.

In this application, claim 1 claims "an ANFO explosive composition", claim 17 claims "the use of a chemical coupling agent in an ANFO explosive composition" and claim 31 claims "a method for producing an ANFO explosive composition". Therefore, each of the claims is directed at a different explosive composition. Accordingly, as Baker contains teaching directed to dynamite and not ANFO, and as Baker only discloses the use of epoxidized soybean oil with dynamite and not ANFO, Baker does not anticipate any of claims 1, 17 and 31.

With respect to the second point, the applicant notes that Baker relates to a method of desensitizing dynamites. Desensitizing compounds are selected from a class of compounds including diesters, polyesters, triesters except those esters containing benzyl rings, and dialkyl substituted amides or combinations thereof. Table II of Baker lists a series of compounds that were tested as desensitizers for dynamite. Therefore in Baker the purpose of incorporating epoxidized soybean oil into the dynamite formulation was to reduce the sensitivity of the dynamite. The results of Examples 2-24 of Baker evidence that epoxidized soybean oil functions as a desensitizing agent when incorporated into a semi-gelatin type dynamite. This conclusion is based on the results of the 3 tests used to evaluate desensitizers in Baker (i.e. the 5 kg impact test, the gap test, and the product fume (%) reduction test) and is further supported by the fact that epoxidized soybean oil was not cited as a poor desensitizing agent by Baker.

As noted by Baker, dynamite is a hazardous material due to its ease of detonation following a particular impulse (Baker, column 1, lines 22-27). Given the high sensitivity of dynamite, the motivation of Baker to reduce the dangers of accidental initiation by incorporating a desensitizing agent like epoxidized soybean oil into semi-gelatin type dynamite formulations is understood. In contrast, ANFO is known to have a relatively low initiation sensitivity by persons skilled in the art. The need to sensitize ANFO explosive compositions is discussed in paragraph 67 of the instant application. Accordingly, a person skilled in the art would not incorporate a desensitizing agent into ANFO explosive compositions. Therefore, a person skilled in the art, upon reading Baker, would not be drawn to incorporate the desensitizing compounds of Baker, including epoxidized soybean oil, in an ANFO explosive composition. Essentially, Baker teaches that epoxidized soybean oil is a desensitizer for semi-gelatin type dynamite whereas the applicants have determined that it is beneficial to maintain the stability of an ANFO explosive composition. Therefore, a person skilled in the art upon reading

Baker would not be drawn to incorporate epoxidized soybean oil in an ANFO explosive composition.

In claims 11 and 39, the applicant has specified that the ammonium nitrate particles have a density above about 0.86 g/cc. In claim 12, the applicant has specified that the ammonium nitrate particles substantially comprise mini-prills. In claims 13 and 42, the applicant has specified that the ammonium nitrate particles have a density above about 1.00 g/cc. The applicant respectfully submits that even if Baker were to be considered to teach the use of epoxidized soybean oil with an ANFO explosive composition, which is not admitted, Baker would not teach its use with the forms of ammonium nitrate particles set out in claims 11-13, 39 and 42. Various types of ammonium nitrate particles are also known. As stated by the applicant at the end of paragraph 49 of the application:

> "The ammonium nitrate particles may be of high density (e.g., 0.86 – 1.1 g/cc or higher), which are of a low porosity (e.g., absorbs less than about 6% oil) or low density (e.g., 0.6 – 0.85 g/cc), which are of a higher porosity (e.g., absorbs about 6% or more of oil)."

If there is excessive separation of the oil from the ammonium nitrate particles, then the formulation may not explode. As stated by the applicant in paragraph 50 of the application:

> "The factors that affect the oil adsorption of particulate ammonium nitrate include the porosity of the ammonium nitrate, the coating, if any, on the surface of the ammonium nitrate particle and the surface area of the ammonium nitrate particle. As the porosity and the surface area of ammonium nitrate particles decrease, the absorbability of the particles decreases. Further, certain coatings tend to decrease the absorbability of the ammonium nitrate particles. Thus even ammonium nitrate particles having a high porosity may benefit from this invention if the particles have been coated."

The use of high density mini-prills is advantageous. As stated by the applicant in paragraph 52 of the application:

"The high density mini-prills provide a high particle surface area and uniformity in particle shape. The high density mini-prills allow for dense particle packaging while retaining sufficient air void spaces between the explosive particles to permit the mixture to function effectively as an explosive. Furthermore, the high density mini-prills provide greater amounts of the ammonium nitrate per unit volume of the explosive, further increasing the total energy release and explosive velocities of the explosive composition."

However, such particles have a lower porosity and are more susceptible to oil segregation. The use of epoxidized soybean oil advantageously reduces oil settlement and therefore assists in maintaining the stability of the ANFO explosive composition. The applicant respectfully submits that Baker does not disclose the use of epoxidized soybean oil with such compositions and therefore does not anticipate claims 11 - 13, 39 and 42.

In addition to the forgoing, the applicant has added new claims 45 and 46. In each of these claims, the applicant has specified that the oxidizer salt particles and the organic combustible fuel are present in a weight ratio of 94 to 6. Baker discloses a dynamite composition that contains 68 % ammonium nitrate (65 % if the formulation contains epoxidized soybean oil. Accordingly Baker does not disclose the formulation of claims 45 and 46 and therefore does not anticipate claims 45 and 46.

In the Office Action, the Examiner rejected claims 17-30 and 41 under 35 USC 112 and 101 as not setting out any method steps. Claim 41 depends from claim 31. By this Response, the applicant has amended claim 41 to refer to the method of

claim 31 as opposed to the use of claim 31. The applicant has cancelled claims 17-30 without prejudice.

In view of the forgoing, favourable consideration of the application with a view to allowance is respectfully requested.

Respectfully submitted,

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